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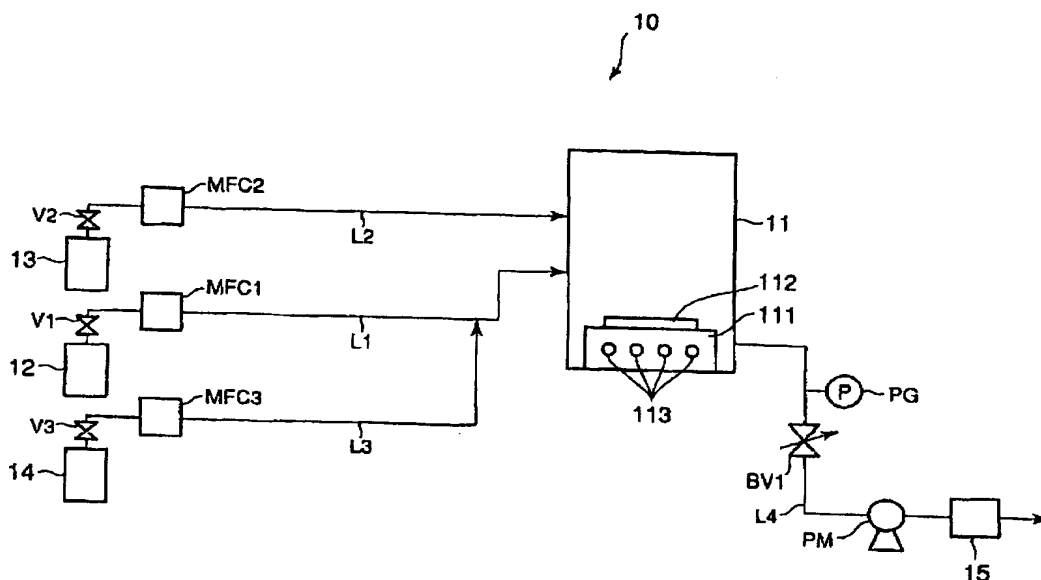
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(54) Title: METHODS FOR PRODUCING SILICON NITRIDE FILMS BY VAPOR-PHASE GROWTH



(57) Abstract: To provide a method that is not accompanied by the production of ammonium chloride, avoids significant admixture of carbonaceous contaminants in the film products, and can produce silicon nitride films with improved film properties even at relatively low temperatures. Silicon nitride films are formed on substrates by feeding a hydrazine gas and at least 1 precursor gas selected from the group consisting of trisilylamine gas and a silylhydrazine gas into a reaction chamber (11) that holds at least 1 substrate (112) and inducing the vapor-phase reaction of the two gases. Silylhydrazine gas can also produce silicon nitride films by itself by thermal decomposition.



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# INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/048973 A1 (OHMINE TOSHIMITSU ET AL) 6 December 2001 (2001-12-06)	1-8,
Y	paragraph '0031! - paragraph '0047!;	10-16
	claims 1-4,7-11; figures 1,6-9; example 1;	9
	compound 9	
X	SMIRNOVA T P ET AL: "SiCN alloys obtained by remote plasma chemical vapour deposition from novel precursors" PREPARATION AND CHARACTERIZATION, ELSEVIER SEQUOIA, NL, vol. 429, no. 1-2, 1 April 2003 (2003-04-01), pages 144-151, XP004421425	10,11, 15-17
Y	ISSN: 0040-6090 page 144 - page 145	9

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	VORONKOV M G ET AL: "Silyl derivatives of asymmetric dimethylhydrazine as a reagents for synthesis of composite layers in silicon-structures"	10,15,17
Y	IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENII, MATERIALY ELEKTRONNOI TEHNIKI, vol. 4, 2002, pages 57-60, XP002278439 abstract & DATABASE CA 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 2002, retrieved from STN Database accession no. 140:85266 abstract	9
E	EP 1 441 042 A (AIR PROD & CHEM) 28 July 2004 (2004-07-28)  claims 1-4,9,12-15; examples 7-12; table 2	1,2,7,8, 10,11, 15,16
A	US 2001/024867 A1 (SAIDA SHIGEHICO ET AL) 27 September 2001 (2001-09-27) claims 7-16; figure 13	1-17
A	GB 1 006 803 A (STANDARD TELEPHONES CABLES LTD) 6 October 1965 (1965-10-06) page 1, column 2, line 56 - line 84; claims 1-10	1-17

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Information on patent family members

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